ence the physiological processes of animals in chemical treatment groups, thus complicating the interpretation of studies. The NTP/NIEHS is conducting studies with diet modification and diet restriction in combination with chemical treatment. The objectives of these studies are to assess 1) the influence of body weight on the carcinogenic response by comparing an *ad libitum* fed control group and a diet restriction control group with a high-dose treatment group, 2) the influence of moderate (~20%) diet restriction in control and treatment groups on the sensitivity of chemical response, and 3) the influence of diet modification on body weight, chronic diseases, tumor rates, and life span.

The problems associated with increasing body weights and decreasing survival of rats must be resolved in order for long-term carcinogenicity studies to be reliable. Rodent diets did not change substantially during the last 15 years. Researchers want large rodents at low cost, which may be the main reason for selecting breeding colony animals that reproduce early and grow faster thus increasing the body weight of breeding colony animals year after year. If not controlled at the breeding colony, the current selection process of breeders would still lead to higher body weights with higher tumor rates and a shorter life span. Diet restriction to lower body weight may be a treatment of the symptom rather than the cause. Recommendations for permanently resolving the problem include 1) selecting slower-growing breeders in the production colonies to lower the body weight of the progeny, 2) modifying diets so they are adequate for growth and maintenance but do not contain excesses of growth-enhancing nutrients, and 3) modifying the feeding behavior of rodents by husbandry procedures such as group caging and making food available only during the normal feeding period (night).

Biodegradation As a Remedy

Biological treatment of hazardous wastes may be an effective, practical, and economical way to remediate Superfund sites and other hazardous wastes. Scientists from across the United States and from several other nations discussed the principles of microbial detoxification and transformation of environmental contaminants at the conference "Biodegradation: Its Role in Reducing Toxicity and Exposure to Environmental Contaminants," held April 26–28 and hosted by the NIEHS Superfund Basic Research Program. The purpose of the conference was to examine the current state of knowledge, the research needs in biodegradation and treatment, and the role of these processes in reducing the toxicity of and exposure to environmental contaminants. More than 300 registrants participated in the three-day meeting, which included presentations by invited speakers and about 60 posters by representatives from industry, academia, and government. The meeting was divided into three broad topic areas: toxicity reduction, exposure reduction, and microbial ecology. Each area was discussed from a multidisciplinary perspective under the broader context of basic research in biodegradation.

Steering Committee for the biodegradation conference (back row, left to right): William Suk, James Hunt, Steven Aust, James Tiedje, Robert Arnold, (front row) Martin Alexander, Lily Young, Daniel Abramowicz, Jodi Shann.

The session on toxicity reduction included presentations on the genetics of novel biodegradation pathways, the biochemistry and genetics of polychlorinated biphenyl (PCB) metabolism, and degradation by fungal peroxidases. In the session on exposure reduction, presenters discussed mechanisms of treatment by white rot fungus, soil treatment laboratory and field studies, and PCB cleanup. The session on microbial ecology focused on selecting chemical-specific degrading bacteria, enhancing degradation capabilities through molecular biological techniques, and tracking microbial populations in the effective reduction of exposure.

In opening remarks, the Chair of the Steering Committee, Lily Young of New York University and Rutgers University, stated that disease prevention and reduction of risk and exposure are fundamentally affected by the degradation and transformations of toxic chemicals mediated by microbial communities both in natural environments and constructed treatment systems. William Suk, director, of the NIEHS Superfund Basic Research Program, and a member of the steering committee, pointed out that cleanup of contaminated soils, sediments, and groundwaters not only improves the environment, but it is also a means by which human exposure and health risks can be reduced. The conference ended with closing remarks by Martin Alexander of Cornell University. Alexander addressed the questions yet unanswered about the biodegradation activity of microbes and their interactions with the physical/chemical environment.

New Worker Training Initiative

The U.S. Department of Energy and NIEHS have signed an interagency agreement to develop model worker safety and health training programs for workers involved in waste cleanup at facilities in the nuclear weapons complex. The Congress established the worker training program in the National Defense Authorization Act for fiscal years 1992 and 1993. This authorization appropriates $10 million for worker training. Preference is to be given to current awardees of the NIEHS Worker Education and Training Program.

In the fiscal year 1991 National Defense Authorization Act, Congress requested that DOE "evaluate the suitability of the training program developed by the National Institute of Environmental Health Sciences (NIEHS) pursuant to Section 126 of SARA [Superfund Amendments and Reauthorization Act] for training workers involved in environmental restoration and

waste management activities of the department." The suitability study found that, in general, the technical quality of the hazardous waste worker health and safety training prepared under the NIEHS program would meet DOE facility needs. The program is cost-effective and provides specialized training to meet the needs of specific segments of the DOE workforce.

The cleanup of the nation's nuclear weapons complex will be the largest and most costly environmental remediation effort ever undertaken. The DOE currently estimates that cleanup at the 14 primary weapons complex sites in 13 states will take more than 30 years, cost more than $100 billion, and employ thousands of scientists, engineers, technicians, and construction workers.

A recent congressional report by the Office of Technology Assessment states that current DOE efforts to protect workers involved in hazardous waste cleanup are "hindered by a lack of emphasis on occupational safety and health issues in Superfund and RCRA procedures." The Office of Technology Assessment found three structural flaws in DOE's worker protection: lack of management commitment to occupational safety and health priorities, insufficient professionally trained staff, and lack of independent oversight and enforcement of DOE safety and health policies.

Applications for supplemental awards to support training programs for nuclear weapons site cleanup workers were submitted to NIEHS during March 1993 and will be evaluated through the regular NIH peer review process. New awards for the program will be made on 1 July 1993, and training will begin at waste sites across the country during September.

DeGray Awarded Walter J. Johnson Prize

Janice DeGray, a postdoctoral fellow at NIEHS, has been named the co-recipient of the Walter J. Johnson Prize by the editorial board of the Archives of Biochemistry and Biophysics. The prize includes an expenses-paid trip to the American Society of Biochemistry and Molecular Biology/American Chemical Society Joint Meeting in San Diego, California, in June to receive the prize and a $5000 cash award.

Janice DeGray, co-recipient of the 1993 Walter J. Johnson Prize.

The prize is presented by the editorial board every three years to recognize scientists within five years of completion of their doctorates who publish the scientific papers of greatest distinction. DeGray's paper, "Reduction of Paraquat and Related Bipyridylium Compounds to Free Radical Metabolites by Rat Hepatocytes," was coauthored with NIEHS colleagues D.N. Ramakrishna Rao and Ronald P. Mason. DeGray is in the Free Radical Metabolites Workgroup of the NIEHS Laboratory of Molecular Biophysics.

DeGray's study demonstrates that paraquat and related herbicides are metabolized to free radicals by liver cells. These free radicals are ultimately responsible for the many deaths resulting from accidental poisonings by these chemicals.